CLAIMS

1. A printing process for obtaining patterns of nanometer and micrometer dimensions on a substrate, comprising i) the application of a solution or suspension of a printing material to said substrate, ii) the positioning, without applying pressure, of a stamp provided with relief patterns at a distance of 0 nm to 500 μm from the substrate, and iii) the evaporation of said solution or suspension.

2. The process according to claim 1, wherein said material is chosen from the group constituted by soluble polymers or precursors of polymers.

3. The process according to claim 2, wherein said material is chosen from the group constituted by polyaniline, polyphenylene vinylene, poly(3-alkyl-thienyl) and mixtures thereof.

4. The process according to claim 1, wherein said material is chosen from the group constituted by tris-(quinoline) aluminum, coordination compounds, metallic clusters, rotaxanes, polythiophenes, phthalocyanines, and mixtures thereof.

5. The process according to claim 1, wherein said material is chosen from the group constituted by colloidal substances and nanoparticles.

6. The process according to claim 5, wherein said material is colloidal Au or Ag.

7. The process according to claim 1, wherein said material and/or said solution or suspension is chemically reactive with the surface of said substrate and in particular can produce corrosion, chemisorption, grafting or polymerization.

8. The process according to claim 1, wherein said distance is changed during imprinting.

9. The process according to claim 1, wherein said stamp has multiple protrusions of arbitrary shape and dimensions.

10. The process according to claim 1, wherein said stamp is a hard stamp, preferably made of chromium, steel, silicon oxide, or a polymer like

polymethyl metacrylate, or polycarbonate.

11. The process according to claim 1, wherein said stamp is a stamp made of elastomeric material, preferably polydimethyl siloxane.

12. The process according to claim 1, wherein said stamp is constituted by a thin film of material that floats on said solution.

13. The process according to claim 1, wherein said evaporation step occurs at a temperature in the interval between –70 and 300 degrees Celsius.

14. The process according to claim 6, wherein said substrate has a surface area that is orders of magnitude larger than the dimensions of the protrusions of the stamp.

15. The process according to claim 1, wherein said stamp is arranged in an inclined configuration with respect to the surface of said substrate, thus producing on the substrate patterns with a spatially variable thickness.

16. The process according to claim 1, wherein said solution contains multiple printing materials in the form of solutes, said solutes being suitable to precipitate selectively in different times, thus generating controlled nonuniformities of composition in the resulting patterns.

17. The process according to claim 1, wherein said solutions contain imprinting materials in amounts suitable to react in reaction volumes on the order of magnitude of picoliters.

18. The use of a method according to claim 1 to write locally information in the form of bits on a film or to obtain an information storage density equal to, or greater than, that of binary writing systems.

19. The use of the method according to claim 1 to manufacture electrodes made of organic or inorganic materials.

20. The use of the method as from claim 1 to pattern isolated structures, dots, nanoparticles, and single molecules, where the deposition process is followed by a re-organisation process, particularly re-crystallisation, and dewetting, introducing periodicity or spatial correlations.